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## Assessment of Vulvodynia Symptoms in a Sample of U.S. Women: A Follow-up National Incidence Survey

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### Abstract

**Objective:** To estimate the annual incidence of vulvodynia-like symptoms and evaluate triggers of vulvar pain in a sample of U.S. women.

**Methods:** After a 1-year interval, women who previously participated in a national vulvodynia prevalence study were recontacted and administered a telephone questionnaire that assessed self-reported vulvodynia-like symptoms and triggers of symptoms.

**Results:** From the original cohort of 425 women, 285 (67%) participated in this follow-up study. Symptoms consistent with vulvodynia occurring within 1 year of initial contact were reported by 4.7% of previously asymptomatic women. Nearly 50% of the original patients again reported a history of vulvodynia-like symptoms, with 68.6% of these as persistent over the past year. Of significance, pain or discomfort with first-time tampon use was 2.15 times more likely (95% CI 1.0-4.62) in symptomatic women. These women were also 2.4 times more likely (95% CI 1.29-4.53) to use a combination of tampons and pads for sanitary protection rather than one method alone.

**Conclusions:** Over the course of 1 year, as many as 1 in 20 women may experience new-onset chronic genital pain. Despite a higher likelihood of having discomfort or pain with first tampon use, symptomatic women did not exhibit a preference for sanitary napkins. This indicates that lack of tampon use because of pain may not be an effective screening criterion for vulvodynia. We recommend additional studies with symptomatic and diagnosed women to explore in more detail the issues surrounding tampon use history and chronic genital pain.

### Introduction

VULVODYNIA IS A GENERALIZED or localized vulvar pain syndrome of uncertain etiology characterized by intermittent or constant discomfort or pain, with burning, stinging, irritation, or rawness lasting for 6 months or longer, which clinically is a diagnosis of exclusion.<sup>1</sup> Factors complicating diagnosis include vague symptoms,<sup>2</sup> absence of vulvar pathological conditions,<sup>3</sup> clinicians unfamiliar with the condition,<sup>4</sup> and lack of a confirmatory diagnostic test. Al-

though vulvodynia was described in the literature in the late 1800s,<sup>5</sup> many questions about its epidemiology and risk factors remain.

The lifetime prevalence of vulvodynia is approximately 9%–16% in the U.S. female population.<sup>6–8</sup> Studies evaluating vulvodynia have been limited by the lack of incidence data that would further characterize this gynecological condition, which affects up to 14 million women in the United States during their lifetime.<sup>7</sup>

This follow-up national telephone survey ascertained the

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number of women who reported new vulvodynia-like symptoms and those who denied these symptoms 1 year after initial contact by this study team. As well, current literature suggests that women experiencing pain with first tampon use have an increased risk of later developing vulvodynia compared with women not reporting pain with initial tampon use.<sup>4,7,9</sup> To explore this issue, tampon use history in this cohort also was collected.

## Materials and Methods

Approval for this study was obtained from both the University of Medicine and Dentistry of New Jersey (UMDNJ) Institutional Review Board and Independent Research Consulting. This is a follow-up study to the 2003 national telephone survey by Arnold et al.,<sup>6</sup> which identified 100 women with self-reported symptoms suggestive of vulvodynia (cases) and 325 asymptomatic women (controls). For the purpose of the original study, a listed sample of U.S. phone numbers was purchased from Survey Sampling, Inc. (Fairfield, CT), and used to identify participants. Controls were matched to cases on 5-year age intervals and time zone, with the four major U.S. time zones represented. Women were excluded if they reported an active gynecological infection or a positive history of conditions known to mimic and complicate the diagnosis of vulvodynia.<sup>6,10</sup> Additional details about subject selection, calling disposition, and survey administration have been described previously.<sup>6</sup>

In this study, up to four phone calls were made on different weekdays and times in an attempt to recontact 424 of the 425 women who participated in the original survey 1-year earlier; one phone number was not recorded in the initial study, and this subject was lost to follow-up. Participants answered a 19-item survey that lasted an average of 10 minutes. They were rescreened for symptoms of vulvodynia using the same criteria adopted in the initial study.<sup>6</sup> In accordance with International Society for the Study of Vulvovaginal Disease (ISSVD) guidelines, vulvodynia symptoms were defined as unexplained intermittent or constant discomfort or pain, with burning, stinging, irritation, or rawness lasting for 6 months or longer.<sup>1</sup> The Henne Group (San Francisco, CA), the research consulting firm that conducted the initial study, implemented the follow-up questionnaire using the Computer Aided Telephone Interviewing (CATI) system as a means of minimizing interviewer bias. Participants' identification as cases or controls was known to the interviewers, as it was noted in the dataset in response to the question assessing symptom history.

Contact, cooperation, and response rates were calculated using the American Association for Public Opinion Research (AAPOR) definitions.<sup>11</sup> Chi-square, Fischer's exact test, and *t* tests were used to examine differences between populations as appropriate. Odds ratios (OR) and 95% confidence intervals (CIs) were used to characterize associations between vulvodynia-like symptoms and tampon use variables. SPSS 10.1 and SAS 9.1 (Cary, NC) were used for analysis, with statistical significance set at  $p < 0.05$ .

## Results

Of the 425 women from the initial national prevalence survey, 318 (75%) were successfully recontacted (Table 1). Among the 107 remaining women, 88 (or 21% of the origi-

nal sample) had either moved or disconnected their number, thus preventing the possibility of recontact. The study obtained a cooperation rate of 89.6% and a response rate of 67.2%, resulting in 285 participants. Characteristics of responders and nonresponders were examined using data gathered in the original survey (Table 2). Significant differences were found with respect to age, marital status, level of education, and race. Nonresponders were typically younger than responders, with more than half <45 years of age (54.17% vs. 35.09%). They also tended to be single or divorced/separated (34.79% vs. 17.09%) and of a race other than Caucasian or black (14.29% vs. 6.67%). Whereas more than one third of each population had at least a college degree, responders were more likely to have a graduate degree (16.84% vs. 5.76%). Although there were no significant differences in employment status, a higher proportion of responders were retired (24.82% vs. 13.77%). With respect to health status, there were no significant differences in self-reported quality of life, stress levels, overall health, and history of depression.

The follow-up population in this study comprised 213 original controls and 72 original cases (Fig. 1). When subjects were reassessed for history of vulvodynia-like symptoms, 17 of the 213 controls reported ever experiencing symptoms. Ten of these women stated symptoms occurred since the last telephone contact, yielding an incidence of 4.7%. Seven controls reported experiencing vulvodynia-like symptoms more than 1 year ago and, therefore, were not included in the incidence calculation.

It was expected that at follow-up, the 72 original cases would again report a positive history of vulvodynia-like symptoms; however, only 35 reconfirmed their case status (Fig. 1), 24 (68.6%) of whom stated the most recent symptoms occurred within the past year. Surprisingly, 36 original cases denied ever having symptoms, and 1 refused to answer the question. As no questions were asked to determine if this inconsistency in answers was due to a misunderstanding of the question or inaccurate self-reporting, data from these 37 women were not included in the follow-up analysis in either the symptomatic or asymptomatic groups. Thus, the follow-up analysis divided women into an asymptomatic group ( $n = 196$ ) confined to subjects who denied symptoms in both studies and a symptomatic group ( $n = 52$ )

TABLE 1. CALLING DISPOSITION AND CODING FOR CALCULATING CONTACT, COOPERATION, AND RESPONSE RATES OF 425 WOMEN IN FOLLOW-UP STUDY

<i>Calling disposition</i>	<i>No. of records</i>	<i>Code<sup>a</sup></i>
Complete	285	I
Partial	2	P
Subject died or unavailable	18	NC
Unable to participate (physical, mental, miscellaneous reasons)	3	O
Disconnected number	58	NC
Respondent not at residence	30	NC
Refusal—Do not call	28	R
Phone number not recorded in original survey	1	NC

<sup>a</sup>Contact reported as: I = complete interview; P = partial interview; NC = noncontact; R = refusal and breakoff; O = other.

TABLE 2. CHARACTERISTICS OF RESPONDERS AND NONRESPONDERS IN FOLLOW-UP SURVEY<sup>a</sup>

Characteristic	Responders (n = 285)	Nonresponders (n = 140)	p value
Age range, No. (%)			<0.0001
18–24 years	7 (2.46%)	18 (12.86%)	
25–34 years	36 (12.63%)	38 (27.14%)	
35–44 years	57 (20%)	24 (17.14%)	
45–54 years	66 (23.16%)	22 (15.71%)	
55–64 years	53 (18.6%)	19 (13.57%)	
65–80 years	66 (23.16%)	19 (13.57%)	
Employment status, No. <sup>b</sup> (%)			0.068
Employed (full or part-time)	158 (57.66%)	90 (65.22%)	
Student/homemaker	36 (13.14%)	20 (14.49%)	
Unemployed	12 (4.38%)	9 (6.52%)	
Retired	68 (24.82%)	19 (13.77%)	
Marital status, No. <sup>c</sup> (%)			0.0005
Single, never married	27 (9.47%)	27 (19.57%)	
Divorced/separated	22 (7.72%)	21 (15.22%)	
Widowed	27 (9.47%)	6 (4.35%)	
Married/marriagelike relationship	209 (73.33%)	84 (60.87%)	
Education, No. <sup>d</sup> (%)			0.0112
High school or less	77 (27.02%)	49 (35.25%)	
Some college/associate's degree	88 (30.88%)	43 (30.94%)	
College degree	72 (25.26%)	39 (28.06%)	
Graduate degree	48 (16.84%)	8 (5.76%)	
Race, No. (%)			0.0107
White	248 (87.02%)	106 (75.71%)	
Black	18 (6.32%)	14 (10%)	
Other	19 (6.67%)	20 (14.29%)	
Overall health, <sup>e</sup> mean $\pm$ SD	2.29 $\pm$ 1.01	2.36 $\pm$ 1.06	
Quality of life, <sup>f</sup> mean $\pm$ S.D.	8.34 $\pm$ 4.99	9.68 $\pm$ 12.29	
Level of stress, <sup>g</sup> mean $\pm$ S.D.	6.06 $\pm$ 7.75	5.70 $\pm$ 2.53	
Depression, No. (%)	73 (25.61%)	45 (32.14%)	

<sup>a</sup>Based on data provided in the original survey (Arnold et al.<sup>6</sup>).

<sup>b</sup>n = 11 responders and n = 2 nonresponders answered "other."

<sup>c</sup>n = 2 refused to provide relationship status.

<sup>d</sup>n = 1 nonresponder answered "other."

<sup>e</sup>Self-reported on a 1–5 scale, where 1 = excellent and 5 = poor.

<sup>f</sup>Self-reported on a 1–10 scale, where 1 = worst possible and 10 = best possible quality of life.

<sup>g</sup>Self-reported on a 1–10 scale, where 1 = least possible and 10 = most possible amount of stress.

comprised of the 35 reconfirmed cases plus the 17 original controls who reported vulvodynia-like symptoms at follow-up.

Symptomatic and asymptomatic women were similar in age, menopausal status, and racial distribution (Table 3). Although the symptomatic group reported significantly higher stress levels, there were no differences noted regarding quality of life and assessment of overall health. When questioned about chronic pain or discomfort with tampon insertion, speculum insertion, intercourse, and exercise, a significantly higher proportion of symptomatic women reported situational pain in all four circumstances (Table 4). Notably, half of the symptomatic group experienced dyspareunia, and slightly more than 25% experienced pain with tampon and speculum insertion, compared with <5% of their asymptomatic counterparts.

Several questions were designed to investigate relationships between vulvodynia-like symptoms and menstrual history, specifically tampon use. When queried about preferred method of sanitary protection, symptomatic women

were 2.4 times as likely to report using a combination of pads and tampons as opposed to one method alone. Of the subgroup not using tampons, symptomatic women were nearly twice as likely as asymptomatic women to report using only sanitary pads during menstruation because of discomfort with tampon use (OR 1.92, 95% CI 0.57–6.41), although this finding was not statistically significant (Table 5). Similarly, of those who had tried tampons, symptomatic women were twice as likely to report a history of discomfort or pain with first-time use (OR 2.15, 95% CI 1.0–4.62). A small but non-significant portion of these women (6.1%) found their first tampon experience so painful that they never used them again.

## Discussion and Conclusions

This is the first study of which we are aware that followed a nationally selected group of women in a nonclinic setting across time, assessing the incidence of vulvodynia-like symptoms. This national telephone survey yielded a 4.7% in-

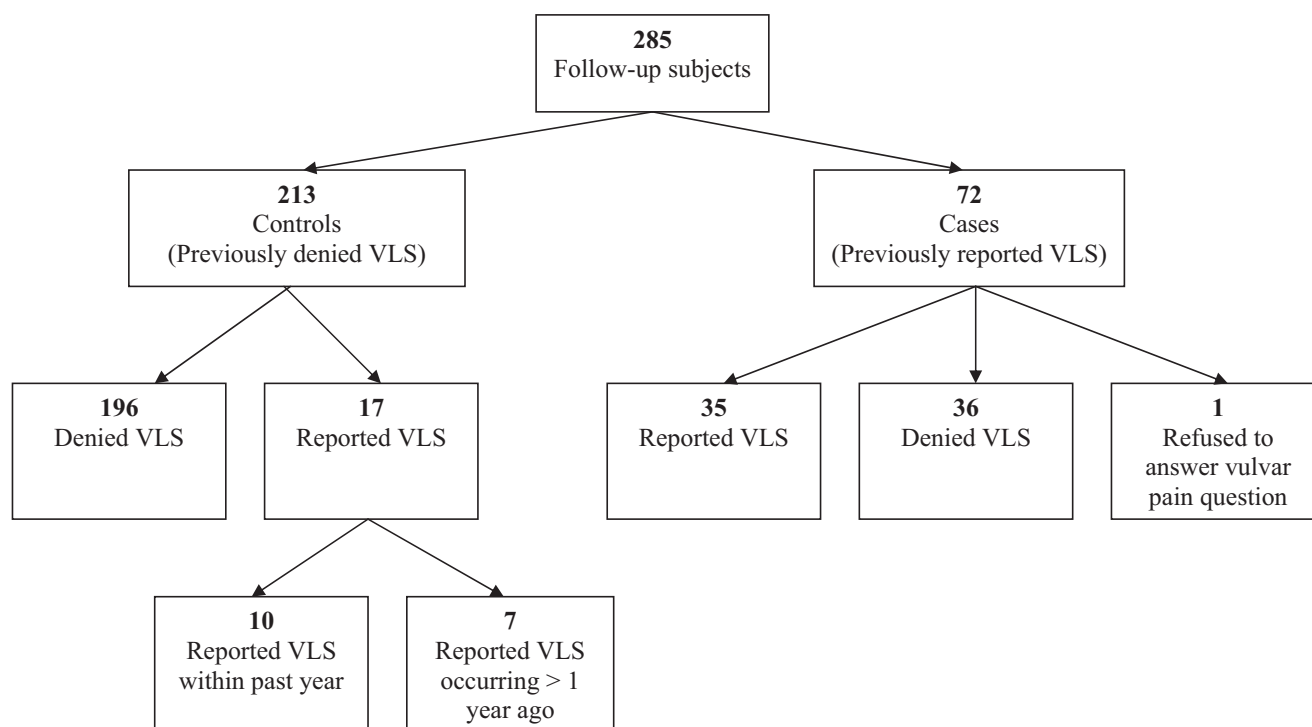


FIG. 1. Characterization of vulvodynia-like symptoms (VLS) among 285 follow-up subjects.

cidence of self-reported vulvar pain symptoms consistent with vulvodynia, suggesting that as many as 1 in 20 women experience new-onset genital pain lasting at least 6 months within a 1-year period. It is acknowledged that this figure may be an overestimate or underestimate of incidence, as it is influenced by the fact that (new) symptom status of 112 women in the original asymptomatic group was unknown at follow-up because of failure to recontact them. There may be concern that response bias influenced participation and thus affected the incidence estimate, but we believe this effect is minimal for two reasons. First, the survey was pre-

sented to women as "a follow-up to the women's health survey you answered approximately one year ago" without mention that occurrence of genital pain symptoms would be assessed. This reduced the opportunity for refusal based on not wanting to talk about (new) symptoms. Second, nearly two thirds of nonresponse was the result of disconnected numbers and subjects no longer at the residence ( $n = 88$  of  $n = 140$  nonresponders); only 28 subjects (or 6.6% of the original population) refused to participate. Thus, the majority of nonresponse was not based on likelihood (or lack thereof) to participate because of the nature of the survey but rather the

TABLE 3. CHARACTERISTICS OF WOMEN WITH AND WITHOUT SELF-REPORTED VULVODYNIA-LIKE SYMPTOMS

Characteristic	Asymptomatic (n = 196)	Symptomatic (n = 52)
Age (mean $\pm$ SD)	53.20 $\pm$ 15.44	49.87 $\pm$ 14.26
Overall health (mean $\pm$ SD) <sup>a</sup>	2.47 $\pm$ 0.97	2.44 $\pm$ 0.98
Quality of life (mean $\pm$ SD) <sup>b</sup>	7.86 $\pm$ 1.44	7.94 $\pm$ 1.36
Level of stress in life (mean $\pm$ SD) <sup>b,c</sup>	5.34 $\pm$ 2.29	6.35 $\pm$ 2.16
Premenopausal (No., %)	90 (45.9%)	22 (42.3%)
Race <sup>d</sup> (No., %)		
White	169 (86.22%)	47 (90.38%)
Black	12 (6.12%)	2 (2.85%)
Other	15 (7.65%)	3 (5.77%)

<sup>a</sup>Reported as "excellent, very good, good, fair, poor" on a scale of 1–5, where 1 = excellent and 5 = poor.

<sup>b</sup>Reported on a scale of 1–10, where 1 is worst possible and 10 is best possible.

<sup>c</sup> $p < 0.05$ .

<sup>d</sup>Other includes Asian, Native American/Alaskan, Native Hawaiian/Pacific Islander, multiracial, and self-described other.

TABLE 4. TRIGGERS OF VULVODYNIA-LIKE SYMPTOMS IN WOMEN WITH AND WITHOUT SELF-REPORTED CHRONIC VULVAR PAIN

<i>Situational pain</i>	<i>Asymptomatic</i> ( <i>n</i> = 195) <sup>a</sup> No. (%)	<i>Symptomatic</i> ( <i>n</i> = 52) No. (%)	<i>Odds ratio</i> (95% CI)
Tampon insertion	3 (1.5%)	14 (26.9%)	23.6 (6.46, 85.6) <sup>b</sup>
Speculum insertion	6 (3.1%)	14 (26.9%)	11.6 (4.19, 32.1) <sup>b</sup>
Intercourse	7 (3.6%)	27 (51.9%)	29.0 (11.44, 73.5) <sup>b</sup>
Exercise	0 (0.0%)	7 (13.7%) <sup>c</sup>	61.9 (3.69, 1175.3) <sup>b,d</sup>

*n* =

<sup>a</sup>1 control reported "don't know" to all questions.

<sup>b</sup>*p* < 0.05.

<sup>c</sup>*n* = 1 reported "don't know."

<sup>d</sup>Correction factor of 0.5 used for asymptomatic cell.

inability to make contact with a viable number. Demographic differences between the groups further support this argument. Specifically, nonresponders were younger and more likely to be single or divorced/separated, with a higher proportion of responders better educated and retired. These characteristics are consistent with mobility among nonresponders and stability among responders with regard to living/employment situations and thus may explain the high percentage of nonviable numbers. Should younger age be positively correlated with vulvodynia, this would make our calculation an underestimate of incidence. Conversely, if none of the original 112 controls we failed to recontact ex-

perienced new symptoms, the most conservative estimate of incidence would be 3.1%.

Although a number of vulvodynia studies require a minimum 3-month duration of symptoms for case definition,<sup>4,7,9,12,13</sup> there is inconsistent evidence for using this time frame for diagnostic purposes.<sup>14</sup> As our study relied on self-reported symptoms without a clinical confirmation of diagnosis, we chose a longer, more conservative time frame to reduce the possibility of misclassification by subjects confusing vulvodynia-like symptoms with other conditions that might mimic vulvodynia but that resolve in a shorter time. However, this stricter case definition criterion may have an

TABLE 5. CHARACTERISTICS OF TAMPON USE IN WOMEN WITH AND WITHOUT SELF-REPORTED VULVODYNIA-LIKE SYMPTOMS

	<i>Asymptomatic</i> No. (%)	<i>Symptomatic</i> No. (%)	(95% CI)
Method of protection	( <i>n</i> = 196)	( <i>n</i> = 52)	
Pads/sanitary napkins only	69 (35.2%)	13 (25%)	0.61 (0.31, 1.23)
Tampons only	49 (25%)	7 (13.5%)	0.47 (0.20, 1.10)
Both pads/sanitary napkins and tampons	78 (39.8%)	32 (61.5%)	2.42 (1.29, 4.53) <sup>a</sup>
Primary reason for not using tampons	( <i>n</i> = 68) <sup>b</sup>	( <i>n</i> = 13)	
Unhygienic	3 (4.4%)	2 (15.4%)	3.94 (0.59, 26.3)
Feel uncomfortable	21 (30.9%)	6 (46.2%)	1.92 (0.57, 6.41)
Pain with insertion	5 (7.4%)	0 (0.0%)	—
Never tried tampons	15 (22.1%)	2 (15.4%)	0.64 (0.13, 3.22)
Other	24 (35.3%)	3 (23.1%)	0.55 (0.14, 2.19)
First tampon experience	( <i>n</i> = 166) <sup>c</sup>	( <i>n</i> = 48) <sup>d</sup>	
Neither painful nor uncomfortable	60 (35.7%)	10 (20.4%)	1.0 <sup>e</sup>
Uncomfortable but not painful	78 (46.4%)	29 (59.2%)	2.23 (1.0, 4.93) <sup>f</sup>
Painful the first time only	20 (11.9%)	6 (12.2%)	1.8 (0.58, 5.58)
So painful that never tried tampons again	8 (4.8%)	3 (6.1%)	2.25 (0.51, 9.95)
Either painful or uncomfortable <sup>g</sup>	38 (79.17%)	106 (63.86%)	2.15 (1.0, 4.62) <sup>g</sup>

<sup>a</sup>*p* < 0.005.

<sup>b</sup>*n* = 1 refused to answer.

<sup>c</sup>*n* = 28 never tried tampons, and 2 reported "don't know."

<sup>d</sup>*n* = 3 never tried tampons, and 1 reported "don't know."

<sup>e</sup>Served as the referent group for odds ratio calculations.

<sup>f</sup>*p* = 0.044.

<sup>g</sup>Calculated by combining "uncomfortable but not painful, painful the first time only, and so painful never tried again"; marginally significant at *p* = 0.046.



impact on the incidence measurement. Specifically, it is possible that some of the original controls experienced vulvodynia-like symptoms within the time between studies, but because of the relatively short follow-up period, these symptoms were present for less than 6 months. Thus, a longer follow-up time (e.g., 2 years, 5 years, or 10 years) may better capture new-onset chronic symptoms of such a long duration. The goal of this study was short term, however, and aimed to examine how many women experienced new symptoms within a year, which is the standard amount of time between well-care gynecological or physical examinations.

Interestingly, the stricter symptom duration criterion adopted in this study may also explain why, at follow-up, 7 original controls unexpectedly reported vulvodynia-like symptoms occurring prior to the original survey. Initially, it seems that these women should have answered "yes" to the vulvodynia symptom question on the initial survey and consequently have been considered as original cases. However, they may have begun to experience symptoms in the months leading up to the original survey but not met the 6-month definition until after the original survey passed. Consequently, they would not have been characterized as cases originally but would also have been missed in an incidence calculation, as symptom onset occurred prior to the first survey and not during the period of interest, which was the time between surveys. Had they been characterized as cases in this situation, the incidence in this study would have been 7.9%.

Of note, there was a subset of original cases ( $n = 36$ ) who reported vulvodynia-like symptoms at first contact but subsequently denied lower genital tract pain at follow-up, a finding that was not expected, as the case definition question assessed "ever" as opposed to "currently" experiencing vulvodynia-like symptoms. Because the survey did not include additional questions to probe for potential contradictions in case answers, these women were removed from the follow-up analysis because they could be confirmed as neither cases nor controls. We suggest several possible explanations for this discrepancy in case reporting between original and follow-up surveys. First, if subjects experienced a resolution of symptoms, either spontaneously or secondary to a medical intervention since the first telephone contact, they may have misunderstood the question as assessing current symptoms and thus answered negatively. This hypothesis, in combination with the fact that approximately one third of original cases reported no symptoms within the past year, would be consistent with previous studies showing that a subset of women will not report vulvar pain for more than 1 year.<sup>3,7,9,15</sup>

A prospective study by Peckham et al.<sup>15</sup> followed 67 women with vulvar pain for 15 years and found that approximately 50% of subjects had spontaneous resolution of their pain, with most remissions occurring within 6 months of pain onset. Pharmacological or behavioral treatment can also have a substantial impact on reduction of symptoms,<sup>16–18</sup> with a recent study demonstrating complete symptom resolution in >40% of patients treated with combination antidepressant therapy for 6 months.<sup>19</sup> Even if symptoms had resolved, however, original cases still should have answered "yes" to the vulvodynia screening question,

as it queried for lifetime history of symptoms. Alternately, these cases may have denied symptoms because of embarrassment or discomfort as a result of the possibility of being overheard by others in close proximity during the time of the survey. Follow-up questions to probe such a discrepancy should be considered in similar studies in the future. Nonetheless, our data suggest that vulvodynia-like symptoms may resolve in a subset of women, which highlights the need for placebo-controlled trials when evaluating vulvar pain interventions. Studies examining resolution of symptoms in diagnosed women would lend insight into possible treatments and a better understanding of the natural course of disease in afflicted women.

Consistent with other studies, we found vulvodynia-like symptoms to be significantly related to the following situations: speculum insertion, intercourse, exercise, and tampon use, especially first-time tampon use.<sup>4,6–9,20,21</sup> Ten of the 14 symptomatic women who reported pain with tampon insertion also reported pain with speculum insertion, demonstrating that there is variation in symptoms even within the commonality of insertional pain. Taken together, these characteristics may serve to support the symptomatic population as having a symptom history reflective of women diagnosed with vulvodynia<sup>14</sup> and to underscore the varied presentations of the disease. It is well documented that vulvodynia has a significant negative effect on sexual functioning,<sup>22</sup> with dyspareunia in particular as a common complaint of diagnosed women.<sup>14</sup> Thus, it is not surprising that intercourse was the most notable situation in which symptomatic women in our study experienced pain, with double the number of women suffering dyspareunia than pain in other insertional circumstances. It is important to remember, however, that dyspareunia alone is not sufficient for diagnosis of vulvodynia, as it may result from a myriad of conditions, including vaginismus, interstitial cystitis, endometriosis, and vaginal atrophy.<sup>23</sup>

Our original study with this national sample of women found that women with vulvodynia-like symptoms had a 2.14 significantly increased odds of having ever used tampons regularly compared with their asymptomatic counterparts.<sup>6</sup> The temporal relationship between ever using tampons and symptom onset was not assessed at that time, however. In considering the pathogenesis of disease, it has been suggested that inflammatory pathways and neuropathies are involved in the development of vulvodynia.<sup>14</sup> Other studies have considered the impact of early life effects that introduce vestibular trauma (e.g., childhood abuse) on the subsequent development of vulvodynia, with inconsistent results.<sup>12,24,25</sup> Thus, one hypothesis that stemmed from the initial survey study was that in certain women, early regular tampon use was traumatic in that it damaged vestibular nerves or instigated inflammatory processes that later manifested as vulvodynia. Although gaining information to support this hypothesis is not possible from a survey alone, this follow-up study served as an opportunity to further explore the association between experiences with tampons and vulvodynia-like symptoms.

When asked about current preferred methods of menstrual protection, symptomatic women were not only less likely to use only tampons but also less likely to use only sanitary napkins; rather they were nearly 2.5 times as likely

to prefer a combination of tampons and napkins. This may suggest that the "ever used tampons regularly" findings characterized in the initial survey occurred prior to symptom onset and that once women experienced chronic genital pain, tampons triggered or exacerbated symptomatic periods enough to encourage avoidance of solely using tampons. Supporting this, symptomatic women were more likely than their asymptomatic counterparts to not use tampons because of physical discomfort, although associations were not significant. Similarly, the chafing some women experience with sanitary napkins may also trigger or exacerbate symptoms and result in avoidance of this method of protection. Thus, the preference symptomatic women exhibited for a combination method of protection may reflect differences in symptomatology (e.g., pain with insertion vs. pressure or constant vs. intermittent pain) or timing of symptoms in relation to the menstrual cycle. It is difficult to assess the extent of such associations because of the small sample size.

When considering initial tampon experiences, women who reported symptoms consistent with vulvodynia were 2.15 times as likely to have experienced discomfort or pain with first tampon use. This association is substantially lower than the 7–8-fold risk reported most recently by Harlow and Stewart<sup>7</sup> but more consistent with the 2.4 increase in risk reported in an earlier study by this same group.<sup>4</sup> Even though this experience was not severe enough to significantly prevent women from ever trying tampons again, the extent of pain or discomfort with first-time tampon insertion should be examined as an early indicator of vulvodynia and, thus, as a possible screening mechanism for early-stage disease.

The follow-up of this national sample of women indicates that the annual occurrence of new-onset chronic genital pain may be substantial. Although our study does not confirm vulvodynia in any of the symptomatic patients, it has been demonstrated that self-reported symptom history is a reliable means of assessing vulvodynia, with office examination confirming disease in 96% of those who self-reported symptoms on a survey.<sup>13</sup> This reliability of self-reporting, combined with our finding that nearly 5% of previously asymptomatic women indicated new vulvodynia-like symptoms within a 12-month period, should serve to encourage the importance of healthcare providers' sensitivity to asking patients about (new-onset) chronic genital pain at annual examinations.

It is important to raise awareness about the condition and for the clinical community to be proactive in asking patients about chronic genital pain at routine annual examinations. Although sample size limited the interpretation of tampon findings, preliminary data suggest that the issues of first-time tampon experiences and the way in which symptomatic women handle their menstrual cycle are complex, making it difficult to discern specific questions to assist with the diagnosis of vulvodynia. To truly understand how such measurements relate to the incidence of vulvodynia, future large-scale studies are needed in which physical examination or medical record review is done to confirm whether self-reported chronic vulvar pain symptoms are consistent with a diagnosis of vulvodynia and to explore the issues raised here about symptom resolution and tampon use in a diagnosed population of women.

## Disclosure Statement

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